

# इंटरनेट

# मानक

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Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

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Mazdoor Kisan Shakti Sangathan

“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 3976 (2003): Protective Rubber Canvas Boots for Miners  
[CHD 19: Footwear]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

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“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”



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भारतीय मानक  
खनिकों के लिए रबड़ कैनवस के संरक्षी बूट – विशिष्टि  
( पाँचवाँ पुनरीक्षण )

*Indian Standard*  
PROTECTIVE RUBBER CANVAS BOOTS  
FOR MINERS — SPECIFICATION  
( *Fifth Revision* )

ICS 13.340.50

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**BUREAU OF INDIAN STANDARDS**  
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NEW DELHI 110002

## FOREWORD

This Indian Standard ( Fifth Revision ) was adopted by the Bureau of Indian Standards, after the draft finalized by the Footwear Sectional Committee had been approved by the Chemical Division Council.

Protective rubber canvas boots are used by workers engaged in underground mining of coal, mica, silica, clay, stone and other minerals.

Type 1 boots are preferred for use where wet surface condition is prevalent. However depending upon the nature of working in mines, the selection is to be made for use of protective boots.

Workers engaged in wet condition, sometimes face problem of upper fabric being weakened due to continuous use in contact with water and to cope up with failures, steps are taken in this revised standard.

Specification on this subject was last revised in 1995. Based upon feed back from both users and manufacturers, the specification is being revised with modifications and additional requirements. Continuous use for last two decades, the product has established it's worth and is widely used and the problems and failures as are observed during such long use and keeping in mind the improvements that have taken place in the field of textile technology and other footwear accessories and also the requirement of aligning footwear standards of BIS in the line with ISO standards, the present revision is made.

Whether coal or other minerals, the recommendations made in IS 6519 : 1971 'Code of practice for selection, care and repair of safety footwear' is applicable for storage and use of the same.

The composition of Committee responsible for formulation of this standard is given at Annex D.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value shall be the same as that of the specified value in this standard.

**AMENDMENT NO. 1 AUGUST 2004**  
**TO**  
**IS 3976:2003 PROTECTIVE RUBBER**  
**CANVAS BOOTS FOR MINERS — SPECIFICATION**  
**( Fifth Revision )**

( Foreword ) — Insert the following paragraph after para 6:

"IS 3976 Safety rubber canvas boots for miners' is redesignated as 'Protective rubber canvas boots for miners', subsequent to the adoption of 'ISO 8782, Parts 1, 2, 3 and 4' as dual number standards, as all types of Safety, Protective and Occupational Footwear formulated by CHD 19 are being aligned with the definition of Safety, Protective and Occupational Footwear as given in ISO 8782, Part 1. The definition as safety, protective, occupational relates to the required toe impact as per test condition. In view of the same 'Safety rubber canvas boots for miners' is being redesignated as 'Protective rubber canvas boots for miners' in accordance with the requirement specified in IS 15298 (Part 3) 'Protective footwear' in place of 'Safety footwear' as earlier."

[ Page 3, Table 3, Sl No. (v), col 3 ] — Delete '10.5'.

[ Page 3, Table 3, Sl No. (v), col 4 ] — Insert '10.5'.

[ Page 3, Table 3, Sl No. (vi), col 3 ] — Delete '250'.

[ Page 3, Table 3, Sl No. (vi), col 4 ] — Insert '250'.

[ Page 6, clause 6.2, line 2 ) — Substitute 'IS 15298 (Part 1)/ISO 8782 (Part 1)' for 'IS 3400 (Part 3)'.

( Page 6, clause 7 ) — Substitute '**MARKING AND PACKING**' for '**MARKING**'.

( Page 6, clause 7.1.1 ) — Insert the following new clause after 7.1.1:

**'7.2 PACKING**

As agreed to between the purchaser and the manufacturer.'

( CHD 19 )

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Reprography Unit, BIS, New Delhi, India

*Indian Standard*

# PROTECTIVE RUBBER CANVAS BOOTS FOR MINERS — SPECIFICATION

*( Fifth Revision )*

## 1 SCOPE

This standard prescribes requirements and methods of sampling and test for protective rubber canvas boots with protective steel toe cap at toe for industrial protection of the users in mines.

## 2 REFERENCES

The standards listed in Annex A contain provisions which though reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent edition of the standards, listed in Annex A.

## 3 TERMINOLOGY

For the purpose of this standard, the definitions given in IS 2050 shall apply.

## 4 TYPES

This standard covers two types of industrial protective boots namely Type 1 and Type 2, typical of their performance requirement as shown in Fig. 1 and Fig. 2 respectively.

## 5 REQUIREMENTS

### 5.1 Design

The boots of Type 1 and Type 2 are recommended typical to design as shown in Fig. 1 and Fig. 2 respectively.

#### 5.1.1 Fittings

Fittings of the footwear shall be in conformity to Table 9 of IS 1638 ( measurement of men's last ). Boots shall be made in sizes 5 ( matching to parts point 38 ) to 11 ( matching to paris point 45 ).

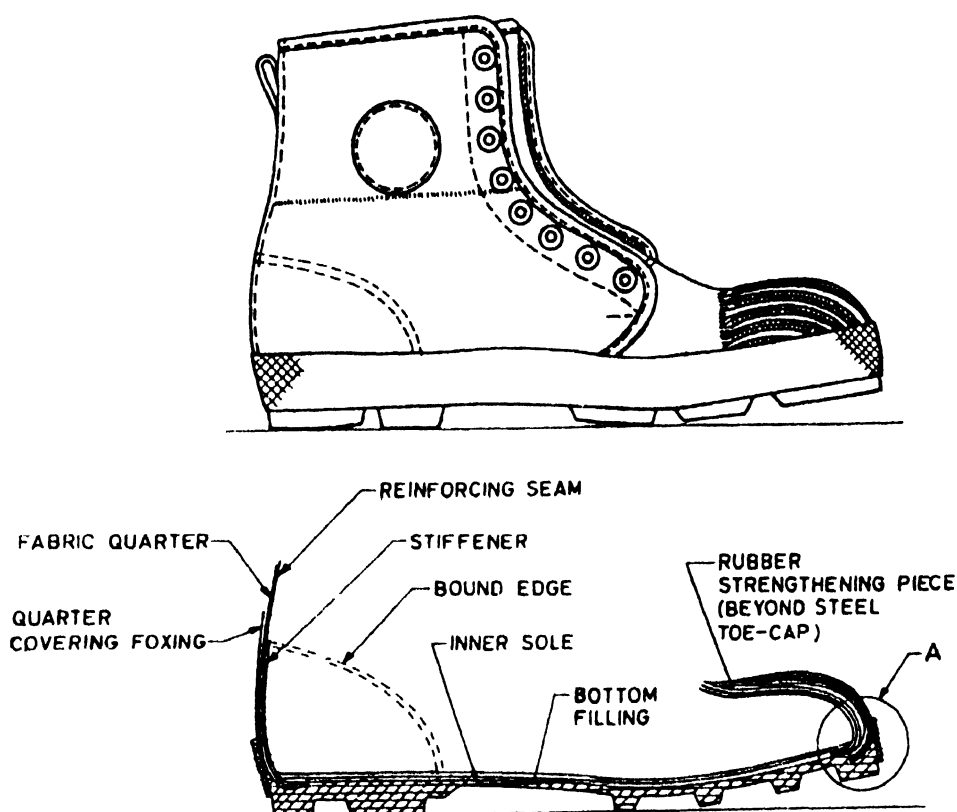


FIG. 1 PROTECTIVE RUBBER CANVAS BOOTS FOR MINES, TYPE I

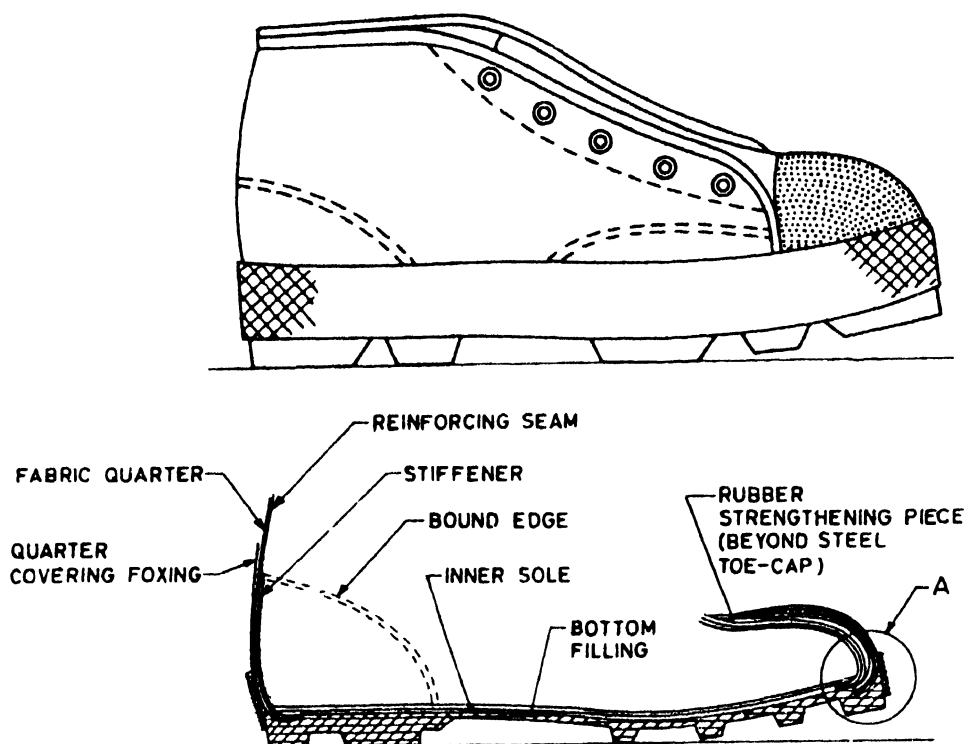


FIG. 2 PROTECTIVE RUBBER CANVAS BOOTS FOR MINES, TYPE 2

## 5.2 Material

### 5.2.1 Upper

The upper shall consist of (Rip stop) fabrics of cotton or man made or it's blend being the over layer and cotton drill as an inner layer and shall conform to the requirements given in Sl No. (i) and (ii) of Table 1.

Two fabrics shall be adhered together with rubber compound so as to achieve the requirements as prescribed for consolidation test and composite upper material strength tests.

Higher value of outer layer and inner layer fabric can also be used as agreed to between the manufacturer and the purchaser to meet the special requirement of performances.

The shade of over layer shall be as agreed to between the purchaser and the manufacturer.

In cases of cotton black outer or inner layer fabric, the same shall be free from sulphur dyes when tested in accordance with Annex B.

**Table 1 Requirements for Overlayer and Inner Layer**  
(Clause 5.2.1)

Sl No.	Materials	Characteristics	Requirements	Method of Test, Ref to IS
(1)	(2)	(3)	(4)	(5)
i)	Over layer	Breaking Load in N, Min:		1969
		a) Warp	1 650	
		b) Weft	1 350	
		c) Ends/dm	220 $\pm$ 5% (2 ply)	1963
		d) Picks/dm	150 $\pm$ 5% (2 ply)	
		e) Construction	RIP Stop	—
ii)	Inner layer (Cotton drill)	Breaking Load in N, Min:		
		a) Warp	1 000	1969
		b) Weft	550	
		c) Ends/dm	390 $\pm$ 12	1963
		d) Picks/dm	195 $\pm$ 12	

### 5.2.2 Binding Material

Binding material shall conform to the requirements given in Table 2 when tested according to the methods as prescribed in col 4 of Table 2.

**Table 2 Requirements for Binding Material**  
(Clause 5.2.2)

Sl No. (1)	Characteristics (2)	Require- ments (3)	Method of Test, Ref to IS (4)
i)	Width, in mm, <i>Min</i>	13	1954
ii)	Breaking load on 50 cm grip of test length average, in N, <i>Min</i>	360	1969

**5.2.2.1** In case of cotton black binding material, the same shall be free from sulphur dyes when tested in accordance with Annex B.

### 5.2.3 Reinforcing Material

Quarter at the back of the upper, heel region shall have a reinforcement with 25 mm minimum wide strip made out of the material conforming to **5.2.1** or any other material as agreed to between the purchaser and the manufacturer having breaking strength not less than that of composite breaking strength of upper as prescribed in 6. Reinforcing materials in specific portions of upper to meet the performance requirement of purchaser may also be provided as agreed to between the manufacturer and the purchaser.

### 5.2.4 Rubber Components

**5.2.4.1** The design of rubber sole heel and other rubber components shall be as agreed to between the purchaser and the manufacturer. Sole-heel as shown in Fig. 3 are recommended only. Sectional view of Type 2 toe position is at Fig. 4.

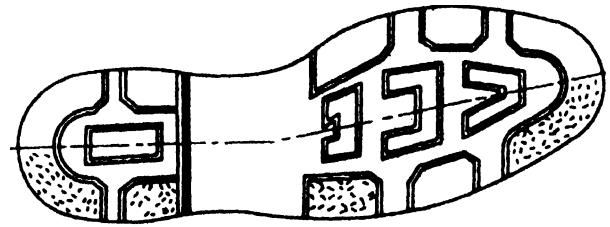


FIG. 3 DESING OF THE SOLE AND HEEL

**5.2.4.2** All rubber components shall conform to Table 3 when tested as per prescribed test method from made up footwear.

### 5.2.4.3 Ageing

Finished boots shall be aged at  $100 \pm 2^\circ\text{C}$  for 24 h. On completion of test, all rubber components shall not develop any sign of tackiness or brittleness. Change in physical requirements after ageing shall conform to the requirements in Table 4.

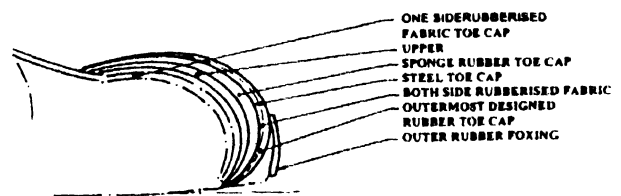


FIG. 4 TYPE 2, TOF POSITION, SECTIONAL VIEW

### 5.2.4.4 Thickness of components

Individual components of the boots shall comply with the thickness and material requirements prescribed in Table 5.

**Table 3 Physical Requirements for Rubber Components**  
(Clauses 5.2.4.2 and 6.1)

Sl No. (1)	Characteristics (2)	Foxing and Toe Cap (3)	Outer Sole Heel (4)	Method of Test, Ref to IS (5)
i)	Relative density, <i>Max</i>	1.4	1.2	3400 (Part 9))
ii)	Hardness IRHD		$60 \pm 5$	3400 (Part 2)
iii)	Hexing resistance, number of cycles			
a)	Initial crack, <i>Min</i>		60 000	3400 (Part 16)
b)	Cut growth at the end of 1 50 000 cycles, Percent, <i>Max</i>		600	
iv)	Change of hardness after accelerated ageing at $100 \pm 2^\circ\text{C}$ for 24 h (IRHD)		+ 5 - 2	3400 (Part 4) 3400 (Part 2)
v)	Tensile strength in Mpa, <i>Min</i>	10.5		3400 (Part 1)
vi)	Elongation at break, in percent, <i>Min</i>	250		3400 (Part 1)

NOTE Readings from 30 to 95 (IRHD) are approximately the same as those of the Shore Durometer, Type A.

**Table 4 Change in Physical Requirements  
After Ageing  
(Clause 5.2.4.3)**

Sl No.	Characteristics	Change in Percent of Original Value	Method of Test, Ref to IS
(1)	(2)	(3)	(4)
i)	Lensile strength	15	3400 (Part 1)
ii)	Elongation at break	15 25	3400 (Part 1)

### 5.2.5 Thread for Upper Closing

The breaking load and construction of sewing thread shall be conforming to requirements as prescribed in Table 6. Colour of thread will be as agreed to between the manufacturer and the purchaser.

In case of black cotton thread, the same shall be free from sulphur dyes when tested in accordance with Annex B.

### 5.2.6 Protective Steel Toe Cap

Protective steel toe cap for industrial protection conforming to Type 2 of IS 5852 shall be used.

### 5.2.7 Laces

The boots shall be provided with lace having length of 115 + 5 cm for Type 1 and 100 ± 5 cm for Type 2.

Minimum breaking load of 45 kg is to be achieved when tested between 18 cm grip in accordance with 9.1 of IS 1969.

In case of cotton lace of black colour, the same shall pass the test for freedom of sulphur dyes when tested in accordance with Annex B. Two ends of the laces shall be provided with plastic tips.

Colour of the lace would be as agreed to between the purchaser and the manufacturer.

### 5.2.8 Eyelets

Aluminium eyelets of collar diameter 10 mm and wall thickness of 0.30 to 0.35 mm shall be used.

## 5.3 Construction

**5.3.1** The upper shall be made matching to shape and dimensions of last in conformity to Table 9 of IS 1638 (Measurement of men's last).

Components of upper is to be stitched in lock stitch machine. Stitch used in the upper will be 30 to 40 per dm (average of 5 measurements) 8 pairs of eyelets for Type 1 and 5 pairs of eyelets for Type 2 or as agreed to between the purchaser and the manufacturer, as the case may be shall be fitted to each upper.

The tongue shall be full bellow for Type 1 and half bellow for Type 2.

**Table 5 Material Requirements of Protective Canvas Boots and Thickness  
Requirement of Individual Components and Rubber Sole  
(Clause 5.2.4.4)**

Sl No.	Components	Material	Thickness, Min mm
(1)	(2)	(3)	(4)
i)	???	Rubber	2 00
ii)	Designed outer most toe cap	Rubber	1 30
iii)	Sponge toe puff under protective steel toe cap	Rubber/Sponge	1.50
iv)	Toe puff between steel toe cap and outer rubber toe	Both side rubberised fabric	
v)	Toe puff inside of upper at toe	One side rubberised fabric	
vi)	Counter	One side rubberised inner layer fabric with suitable blend of rubber and flock	1.3
vii)	Insole	do	2.2
viii)	Bottom filling	Rubber compound or compound with cotton flock or sponge	
iv)	Sole heel:		
a)	Forepart		
1)	with cleat	Rubber	10
2)	without cleat	Rubber	3
b)	Heel		
1)	with cleat	Rubber	15
2)	without cleat	Rubber	9
x)	Foxing covering vamp for use in Type 1 suitable for use in wet condition	Rubber	1

**Table 6 Requirement of Sewing Thread**  
(Clause 5.2.5)

Sl No.	Components	Material	Method of Test, Ref to IS
(1)	(2)	(3)	(4)
i)	Sewing thread for body	Sewing cotton thread variety No. 28 (165 dtex ×) (6 cord, 3 strands, each 2 fold)  Or  Sewing polyester thread variety No. 9 (145 dtex × 6)  Or  Any other thread as agreed to between the purchaser and the manufacturer but breaking strength not less than as specified of above two varieties	1720      9543
ii)	Sewing thread for piping/binding	Sewing cotton thread, variety No. 32 (74 dtex ??? 6) (6 cord, strands, each 2 fold)  Or  Sewing polyester thread variety No. 5 (145 dtex × 3)  Or  Any other suitable thread, as agreed to between the purchaser and the manufacturer but not having breaking strength less than as specified for above two varieties.	1720      9543

The edges of the upper, tongue and the counter shall be bound with binding tape.

Type 1 boots shall be provided with Jugloop. Vamp and half of the quarter of Type 1 boots shall be reinforced with rubber sheet as agreed to between the purchaser and the manufacturer.

Toe of the boot will be reinforced with protective steel toe cap as detailed in Fig. 1 and Fig. 2.

A designed foxing of width not less than 25 mm is to be provided. The foxing shall not extend the edges of the outer sole.

A pair of insole is to be provided.

The boots shall be manufactured by either conventional assembly and vulcanized or direct moulding system or by direct injection process.

#### 5.4 Finish

In appearance, general workmanship and in all other respects with regard to finish and get up of the footwear, the footwear shall be matching to the approved sample of the purchaser. Packing of the finished footwear will be as agreed between the purchaser and the manufacturer.

#### 5.5 Mass

The mass of one pair of finished footwear of size 8 shall not exceed 1500 g for Type 1 and 1 400 g for Type 2 with an increase or decrease of 100 g for each bigger or smaller size respectively.

#### 5.6 Leg Height

Leg height of the boots of Type 1 shall be  $160 \pm 2.5$  mm and for type 2 shall be  $95 \pm 2.5$  mm respectively for size 8 with an increase and decrease of nominal height by 2 mm for each bigger and smaller size respectively when measured on the inside of the back of the footwear and from seat of the insole to top edge of the upper.

#### 5.7 Performance Test

The finished footwear when subjected to impact test in accordance with the method prescribed in Annex C for evaluation of protection factor, they shall withstand a blow of 14 kgf.m. They shall be considered to have passed the test if the clearance inside the boot at the point of maximum depression, when subjected to impact test, is 13.5 mm or more for size 8 and there will be increase and decrease of impact value by 0.5 mm for every size of increase or decrease respectively.

#### 5.8 Adhesion Test

From the upper foxing portion where it is adhered to the upper, parallel to the sole at the waist portion of the boot cut a strip of length 100 mm and of width 8 mm. Separate the plies by breaking the bond to a length of about 75 mm. Carry out the test on two specimens in accordance with IS 3400 (Part 5). There shall be no further separation within 1 min at a load of 800 g for each of the two specimens.

#### 5.9 Consolidation Test

Representative sample of width  $25 \pm 0.5$  mm cut out from the quarter of the upper along the length of boot.

The plies are separated by breaking the bond. Carry out the test on two specimens in accordance with IS 3400 (Part 5). There shall be no separation at a load of 2 kg.

After accelerated ageing at  $100 \pm 2^\circ\text{C}$  for 24 h when the same test is repeated from the aged sample boot there shall be no separation at a load of 1.5 kg.

## 6 BREAKING LOAD OF COMPOSITE UPPER MATERIAL

From the upper representative sample of width  $25 \pm 0.5$  mm width is to be cut along the length of the boot and height of the boot of enough length so as to make it convenient to allow a distance of 30 mm between the jaws of the tensile testing machine.

Rate of traverse of the pulling jaw shall be  $100 \pm 5$  mm per minute. Two such test pieces will be required to be obtained from the made up footwear and will be subjected to test to break each test piece. Mean value of such composite upper material comprising of lengthwise and widthwise test sample breaking test will be 1 000 N/25 mm width (minimum).

### 6.1 Test Piece for Tensile Strength and Elongation at Break

Required test of tensile strength and elongation at break must be carried out from made up footwear and where in test pieces cannot be obtained from made up footwear, standard vulcanized sheet is to be procured from made out moulded rubber sheet of same rubber compound from which the said boot is manufactured.

Such made out test slab will comply the following:

- a) The difference between the specific gravity as measured from sample drawn and the test slab shall differ by more than  $\pm 0.05$ .
- b) The ash content of the test slab as measured shall not differ by  $\pm 1$  percent when tested

from the drawn sample boot.

- c) Value achieved from standard vulcanized sample made out of moulded rubber sheet of same rubber compound, used for production of sample boot, will be 30 percent higher than the value as prescribed in Table 3 serial No. (v) and (vi).

## 6.2 Abrasion Test

When out soles are tested in accordance with Method A given in IS 3400 (Part 3) (with a vertical force of 10 N over an abrasion distance of 40 m) the relative volume loss shall not be greater than  $150 \text{ mm}^3$ .

Test pieces may be taken from anywhere on the sole.

## 7 MARKING

Size of the boot shall be legibly stamped on the waist of the insole fabric. Identification of the source together with the month and year of manufacture shall be legibly stamped at the waist of the insole.

### 7.1 BIS Certification Marking

The product may also be marked with the Standard Mark.

**7.1.1** The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and rules and regulations made thereunder. The details of conditions under which the license for use of the standard mark may be granted to manufacturers or producers may be obtained from Bureau of Indian Standards.

## 8 SAMPLING AND CERTIFICATION FOR CONFORMITY

The scale of sampling and criterion for conformity shall be prescribed in IS 6368 or as agreed to between the purchaser and the manufacturer.

**ANNEX A***(Clause 2)***LIST OF REFERRED INDIAN STANDARDS**

<i>IS No.</i>	<i>Title</i>	<i>IS No.</i>	<i>Title</i>
1638 : 1969	Specification for sizes and fitting of footwear ( <i>first revision</i> )	(Part 2) : 1995	Hardness ( <i>second revision</i> )
1720 : 1978	Specification for cotton sewing threads ( <i>second revision</i> )	(Part 3) : 1987	Abrasion resistance using a rotating cylindrical drum device ( <i>first revision</i> )
1954 : 1990	Determination of length and width of woven fabrics – Methods ( <i>second revision</i> )	(Part 4) : 1987	Accelerated Ageing ( <i>second revision</i> )
1963 : 1981	Methods of determination of threads per unit length in woven fabrics ( <i>second revision</i> )	(Part 5) : 1986	Adhesion of Rubber to textiles fabrics ( <i>second revision</i> )
1969:1985	Methods for determination of breaking load and elongation of woven textiles fabrics ( <i>second revision</i> )	(Part 9) : 1978	Density ( <i>first revision</i> )
2050: 1991	Glossary of terms relating to footwear ( <i>first revision</i> )	(Part 16) : 1974	Measurement of cut growth of rubber by the use of Ross Flexing machine
3400	Methods of test for vulcanized rubbers:	5852 : 1996	Protective steel toe caps for footwear.....Specification. ( <i>third revision</i> )
(Part 1) : 1987	Tensile stress strain properties ( <i>second revision</i> )	6368 : 1971	Method for sampling of rubber and rubber combination footwear
		9543 : 1980	Specification for spun polyester sewing threads

**ANNEX B***(Clauses 5.2.1, 5.2.2.1, 5.2.5 and 5.2.7)***METHOD FOR DETECTION OF SULPHUR DYES IN BLACK COLOURED LACES/NEWAR (TAPE) THREAD AND FABRIC****B-1 PROCEDURE**

**B-1.1** Boil the article in alkaline hydrosulphite solution for 1 mm. If the shade is reduced to pale brown or yellow colour and on oxidation restored to the original colour, sulphur dyes shall be suspected to be present.

**B-1.2** For confirmation, boil the laces in acid stannous chloride solution in a test tube covered with a piece of filter paper moistened with lead acetate. A blackish brown stain with metallic lustre confirms the presence of sulphur dyes.

**ANNEX C***(Clause 5.7)***METHOD OF PERFORMANCE TEST OF PROTECTIVE FOOTWEAR****(Applicable to all types of protective footwear)****C-1 GENERAL**

Performance test is carried out to determine the impact resistance of a protective footwear at the toe end of an energy level of 14 kgf.m.

**C-1.1 Test Piece**

**C-1.1.1** The protective footwear shall be tested at least after 48 h of vulcanization.

**C-1.1.2** The test shall be conducted at the toe of the

protective footwear incorporated with protective steel toe cap, sampled out from both sides of a lot.

C.1.2.3 Preparation of Test Piece

Prepare the test piece from the forepart of the protective footwear by cutting off the toe and approximately 20 mm beyond the rear edge of the incorporated protective steel toe cap, taking care that the lining is not separated. Make a notch on this 20 mm extended upper in line with the text axis to have clear view of the position of the plasticine cylinder in relation to the incorporated protective steel toe cap.

If the protective footwear has a removable insole, carry out the test with it in place.

C-2 DETERMINATION OF IMPACT RESISTANCE

C-2.1 Apparatus

C-2.1.1 Impact Apparatus

The impact apparatus incorporates a solid striker of mass  $27.2 \pm 0.2$  kg to fall freely on vertical guides from a predetermined height to give required energy, calculated as potential energy.

The steel striker strikes a vertical cylindrical steel plunger 38 mm in diameter and 145 mm height. The upper end of the plunger shall mount a 63 mm  $\times$  10 mm thick steel plate and a 155 mm  $\times$  38 mm  $\times$  10 mm

thick horizontal steel striking plate shall be securely fitted to the lower end of the plunger both the plates are replaceable.

The base of the impact apparatus shall be made from hard wood of about 75 mm thickness. The vertical guides, housed in aluminium brackets, shall be secured to the wooden base. A solid steel block of 50 mm thickness, fitted with a 10 mm thick replaceable steel plate, shall be mounted on the wooden base. The steel block shall be supported by two steel angle blocks to prevent sideways movements during the impact.

C-2.1.2 Clamping Device

The clamping device shall consist of a 150 mm  $\times$  150 mm  $\times$  10 mm thick thoroughly machined steel clamping plate with M-10 threaded hole, a clamping alien screw with M-10 thread, on adjusting screw (see Fig. 7) and a stabilizing fork (see Fig. 5).

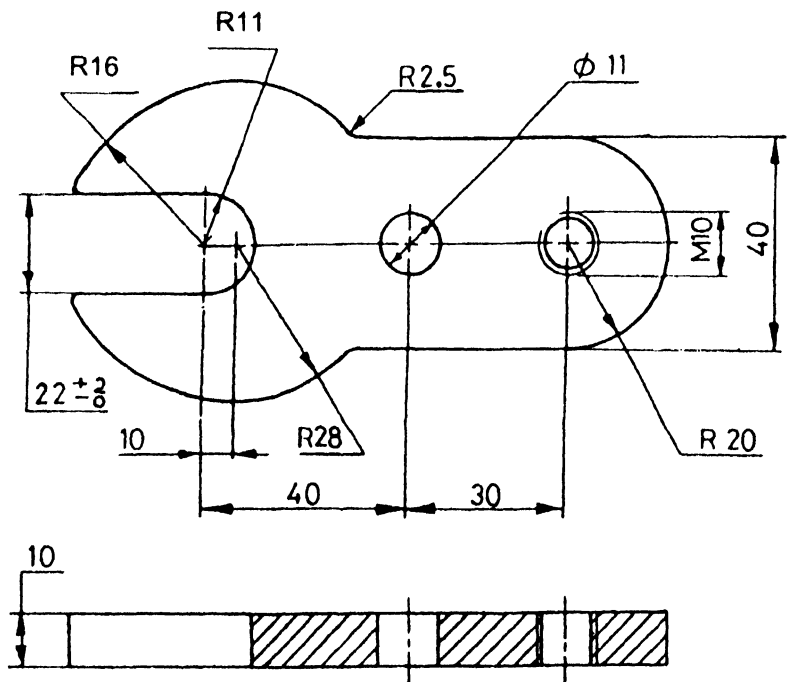
C-2.1.3 A plasticine cylinder of  $20 \pm 1$  mm diameter and  $20 \pm 1$  mm of height (see Fig. 6).

C-2.1.4 A dial vernier calliper or a dial gauge with foot and anvil.

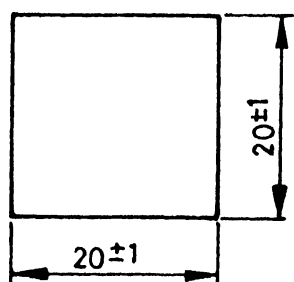
C-3 PROCEDURE

C-3.1 Clamping of the Test Piece

Place the test piece on the clamping base and insert the stabilizing fork, incorporating the plasticine



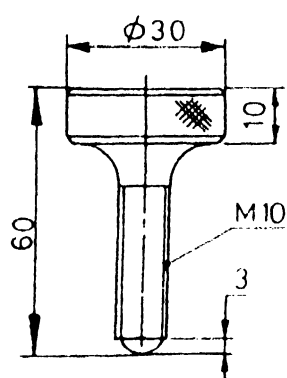
All dimensions in millimetres.  
FIG. 5 STABILIZING FORK



All dimensions in millimetres.

NOTE Flat ends may be covered with aluminium foil.

FIG 6 PLASTICINE CYLINDER



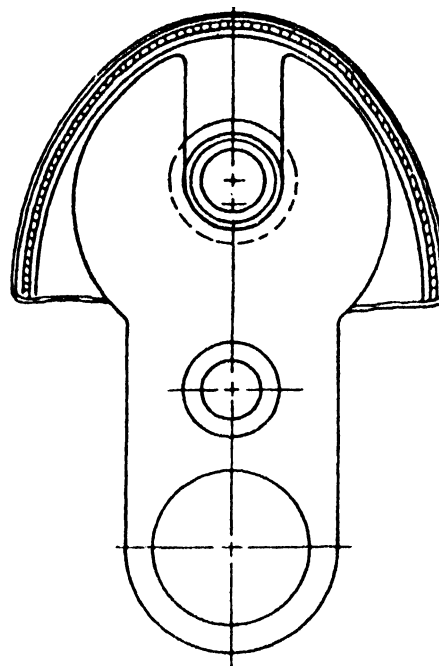
All dimensions in millimetres

FIG 7 ADJUSTING SCREW

cylinder in its slot (*see* Fig. 8). Push the stabilizing fork further inside the test piece so that its tips touch the inner lining.

Now, adjust the plasticine cylinder with gentle core in such a way that the rear edge of the incorporated protective steel toe cap. Fix the stabilizing fork by means of the clamping screw to rest on the insole and tighten the same. Now adjust the adjusting screw to make the stabilizing fork parallel to the clamping plate. Thereafter both the clamping plate and adjusting screws are to be adjusted alternatively, maintaining the parallelism, to ensure firm clamping of the test piece

Now, place the securely clamped test piece under the horizontal striking plate of the vertical cylindrical plunger. Position the horizontal striking plate approximately 1 mm inside the rear edge of the incorporated steel toe cap. The horizontal striking plate



All dimensions in millimetres

FIG 8 PLACEMENT OF THE TEST ???

shall rest on the tested piece lengthwise roughly at right angle (*see* Fig. 9).

Finally, recheck the proper positioning of the plasticine cylinder in relation to the rear edge of the incorporated protective steel toe cap.

#### C-3.1.1 Impact

Adjust the solid steel striker to a height of  $505 \pm 5$  mm above the top steel plate of the vertical cylindrical plunger and release it to fall freely and thus the impact energy shall be of 14 kg.f.m.

#### C-3.1.2 Measurement

Remove the plasticine cylinder carefully by unclamping the test piece and measure the height from top to the base of the plasticine cylinder to the nearest 0.5 mm. Special care is to be taken to ensure that the foot/arm of the measuring instrument has not stuck into the flat surfaces of the plasticine cylinder.

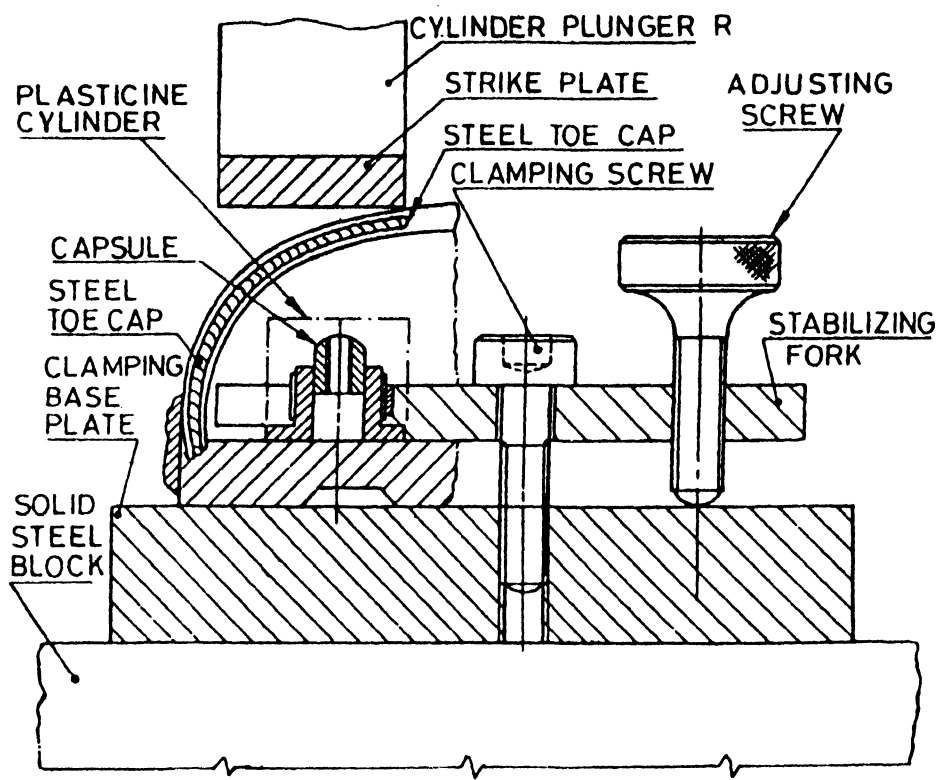


FIG. 9 POSITIONING OF THE TEST PIECE DURING PERFORMANCE TEST

**ANNEX D***(Foreword)***COMMITTEE COMPOSITION****Footwear Sectional Committee, CHD 19**

<i>Organization</i>	<i>Representative(s)</i>
Footwear Design & Development Institute, Noida	SHRI V. B. PARVATIKAR ( <i>Chairman</i> ) Ms RASHMI ( <i>Alternate I</i> ) SHRI DAS ( <i>Alternate II</i> )
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Bengal Waterproof Limited, Kolkata	SHRIMATI SHRIYA S. KARMAKAR SHRI D. DAS ( <i>Alternate</i> )
Bihar Rubber Co Ltd., Ranchi	SHRI J. BASAK SHRI B. BANERJI ( <i>Alternate</i> )
Border Security, Force, New Delhi	SHRI P. S. DHILLON
Central Footwear Training Institute, Agra	SHRI S. N. GANGULY SHRI S. CHAKRABORTY ( <i>Alternate</i> )
Central Footwear Training Institute, Chennai	SHRI PREM PAL
Central Leather Research Institute, Chennai	SHRI B. N. DAS DR R. RAJARAMAN ( <i>Alternate</i> )
Coal India Ltd, Kolkata	MANAGING DIRECTOR
Defence, Materials & Stores Research & Development Establishment, Kanpur	DR. V. S. TRIPA??? SHRI ANURAG SRIVASTAVA ( <i>Alternate</i> )
Department of Industrial Policy & Promotion, New Delhi	SHRI P. K. JAIN SHRI N. C. TIWARI ( <i>Alternate</i> )
Directorate General of Mines Safety, Dhanbad	DIRECTOR ( MSE ) DEPUTY DIRECTOR (MSI), ( <i>Alternate</i> )
Directorate General Aeronautical Quality Assurance, New Delhi	WG CDR S.K. KAPOOR
Glaxo Kid (I) Pvt Ltd, Kolkata	SHRI SURAJIT BANERJEE SHRI SUBHAJIT ??? ( <i>Alternate</i> )
Indian footwear Component Manufacturers' Association, Kolkata	SHRI MANI ALMAL
Indian Leather Technologists' Association, Kolkata	SHRI S. K. BHADRA SHRI A. K. BASU ( <i>Alternate</i> )
Liberty Footwear, Gharaunda	SHRI ADESH GUPTA SHRI S. S. LAHIRI ( <i>Alternate</i> )
Ministry of Defence (DGQA), Kanpur	SHRI GAUTAM GUPTA SHRI R. CHAUDHARY ( <i>Alternate</i> )
Office of the Development Commissioner (SSI), New Delhi	SHRI S.K. BASU
Relaxo Footwear, Delhi	SHRI RAMESH D??? SHRI NIKHIL D??? ( <i>Alternate</i> )
Steel Authority of India Ltd, Bhilai	SHRI R. C. DUBEY SHRI K. HARISANKAR ( <i>Alternate</i> )
The Indian Rubber Institute, Kolkata	SHRI B. DUTTA SHRI ??? PAL ( <i>Alternate</i> )
Tata International, Chennai	SHRI RAMESH SUBRAMANIAM
BIS Directorate General	SHRI S.K. CHAUDHURI, Director & Head (CHD) [Representing Director General ( <i>Ex-officio</i> )

*Member Secretary*

SHRIMATI (DR) KANCHAN ANAND  
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